Isnu Amiseno, 2018, Pembentukan Kurva Kerapuhan Pilar *Skew Bridge* dengan Metode Analisis *Pushover*. Skripsi. Program Studi Teknik Sipil Fakultas Teknik Universitas Sebelas Maret Surakarta.

Jembatan merupakan suatu struktur yang sangat penting untuk mendukung pergerakan manusia maupun barang. Untuk itu diperlukan suatu evaluasi kinerja seismik pada struktur jembatan yang telah dibangun sehingga dapat disimpulkan apakah jembatan tersebut sudah aman atau masih memerlukan pengembangan.

Analisis *pushover* merupakan salah satu metode yang digunakan untuk mengevaluasi kinerja seismik pada struktur jembatan. Penelitian ini dilakukan pada suatu jembatan *skew*, Jembatan Sungai Madiun. Pemodelan jembatan dilakukan dengan bantuan *software* Midas Civil 2011. Pembebanan mengacu pada Standar Nasional Indonesia. Kurva kapasitas dan spektrum kapasitas diperoleh dengan menjalankan analisis *pushover*. Batas-batas kerusakan ditentukan berdasarkan perpindahan menurut Monti dan Nistico (2002) dan rasio *drift* maksimum menurut Kim dan Shinozuka (2004). Kurva kerapuhan dibentuk dengan mempertimbangkan beberapa standar deviasi ketidaktentuan.

Analisis *pushover* menghasilkan kurva kapasitas dengan titik runtuh saat perpindahan 0,1625 m dengan gaya geser dasar 19.401,7 kN. Daerah jembatan memiliki nilai PGA sebesar 0,38 g. Kemungkinan terjadinya tingkat kerusakan *slight*, *extensive*, dan *complete* berdasarkan penelitian Monti dan Nistico (2002) masing-masing adalah 25,26%, 17,78%, dan 11,58%. Kemungkinan terjadinya tingkat kerusakan *slight*, *moderate*, *extensive*, dan *complete* berdasarkan Kim dan Shinozuka (2004) masing-masing adalah 36,45%, 21,23%, 11,58%, dan 0,23%.

Kata Kunci: Jembatan *Skew*, Analisis *Pushover*, Kurva Kapasitas, Spektrum Kapasitas, Kurva Kerapuhan.

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Bridge is an important structure to support human movement and freight movement. Therefore, seismic performance evaluation of bridge structure is needed so that it can be concluded whether the bridge is safe or it still needs an improvement.

Pushover analysis is a method for evaluating the seismic performance of bridge structures. This study was conducted on a skew bridge, Madiun River Bridge. Bridge modeling was supported by Midas Civil 2011 software. Load input was according to Standar Nasional Indonesia. Capacity curve and capacity spectrum were resulted by pushover analysis. Definition of damage states was based on displacement by Monti and Nistico (2002) and was based on maximum drift ratio by Kim and Shinozuka (2004). Fragility curves were formed by considering some lognormal standard deviation parameter.

The pushover analysis resulted a capacity curve which has breaking point on displacement δ = 0.1625 m with base shear V = 19,401.7 kN. Peak ground acceleration of the bridge is 0.38 g. Probability of slight, probability of extensive, and probability of complete based on damage state by Monti and Nistico (2002) respectively are 25.26%, 17.78%, and 11.58%. Probability of slight, probability of moderate, probability of extensive, and probability of complete based on damage state by Kim and Shinozuka respectively are 36.45%, 21.23%, 11.58%, and 0.23%.

Keywords: Skew Bridge, Pushover Analysis, Capacity Curve, Capacity Spectrum, Fragility Curve.